

IN THE DRAWINGS:

The attached sheets of drawings include corrections to FIGs. 3, 5 and 8. These sheets replace the original sheets including FIGs. 3, 5 and 8.

FIG. 3 has been revised to change reference numeral "14" to --24--, to eliminate redundancy with previously used reference numerals; FIG. 5 has been revised to change both occurrences of reference numeral "21" to --22--, to eliminate redundancy with previously used reference numerals, and to add a lead line extending from the right-hand occurrence of reference numeral --16--; and FIG. 8 has been revised to change reference numeral "40" to --40'--, to eliminate redundancy with previously used reference numerals.

The revisions to the drawings do not introduce new matter.

REMARKS

The Office Action dated September 7, 2006, has been received and reviewed.

Claims 1-29 are currently pending and under consideration in the above-referenced application. Each of claims 1-29 stands rejected.

Reconsideration of the above-referenced application is respectfully requested.

Interview Summary Response

During a recent telephone interview, clarification was made on the record regarding a reference that was relied upon in the previous Office Action. Tong (US 2003/0171456) was cited, but inadvertently left off the Form PTO-892. By way of reminder, the Office is to prepare and send a Supplemental Form PTO-892 in the above-referenced application. This reference was also identified in the Interview Summary of September 29, 2006.

Preliminary Amendment

Please note that a Preliminary Amendment was filed in the above-referenced application on July 19, 2004, but that the undersigned attorney has not yet received any indication that the Preliminary Amendment has been entered into the Office file for the above-referenced application. If, for some reason, the Preliminary Amendment has not yet been entered into the Office file, the undersigned attorney would be happy to provide the Office with a true copy thereof.

Rejections under 35 U.S.C. § 102

Claims 1-8 and 19-29 stand rejected under 35 U.S.C. § 102(e) for reciting subject matter which is purportedly anticipated by that described in U.S. Patent Publication 2003/0171456 to Tong et al. (hereinafter “Tong”).

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single reference which qualifies as prior art under 35 U.S.C. § 102. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

With respect to inherency, M.P.E.P. § 2112 provides:

The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) . . . ‘To establish inherency, the extrinsic evidence ‘must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill . . .’’ *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1991).

Tong describes a cureable underfill encapsulant material for application on semiconductor wafers. *See, e.g.*, paragraph [0013]. The encapsulant material described by Tong is a B-stageable composition made up of one or more epoxy resins, an imidazole-anhydride adduct and at least one solvent. *See, e.g., id.* Tong describes applying and initially curing the encapsulant material on a semiconductor wafer. *See, e.g., id.* The initial cure polymerizes the encapsulant material resulting in a smooth, non-tacky coating that ensures clean dicing of the wafer into individual chips. Tong also describes a final cure performed on the encapsulant material after formation of interconnections by solder reflow. *See, e.g., paragraphs [0010] and [0013].*

Independent claim 1 recites a method of forming a protective layer on a plurality of semiconductor device components including, among other steps, healing cracks and delaminated areas in the protective material formed during severing of the components.

It is respectfully submitted that Tong does not expressly or inherently describe healing cracks and delaminations produced during semiconductor dicing. Tong is silent as to whether or not cracks or delaminations in the initially cured B-stage material may be healed. Moreover, it is respectfully submitted that Tong does not describe circumstances in which an affirmative act of healing would occur, or conditions in which healing would inherently occur.

Because Tong does not expressly or inherently describe healing cracks and delaminated areas in a protective material, Tong does not anticipate each and every element of independent claim 1. Therefore, it is respectfully submitted that, under 35 U.S.C. § 102(e), independent claim 1 recites subject matter which is allowable over that described in Tong.

Each of claims 2-8 and 19-29 is allowable, among other reasons, for depending either directly or indirectly from claim 1, which is allowable.

In connection with the rejection of dependent claims 2-8 and 19-29, the Office Action cites *Ex parte Pfeiffer* for the proposition that “structural elements in the claim must manipulatively distinguish the claim from the prior art to have patentable weight.” Office Action of September 7, 2006, pages 3-4. It is respectfully submitted that *Pfeiffer* does not set forth a *per se* rule that structural limitations do not patentably distinguish over the prior art in a method claim.

It is respectfully submitted that, where used in the dependent claims, structural language distinguishes the subject matter in each claim were it appears from the prior art in the sense of the recited method. As the method of claim 1 is drawn to forming a protective layer on plurality of semiconductor components, it is respectfully submitted that the structural elements of such components intrinsically affect the claimed method.

Claim 5 also depends from claim 2 and is further allowable as Tong does not describe providing a fabrication substrate with each of the plurality of semiconductor device components having a conductive structure protruding from the at least one bond pad thereof. Rather, the description of Tong is limited to forming interconnections *after* material is applied to a wafer, initially cured, and the wafer is diced.

Claim 6, which depends from claim 5, is further allowable because Tong neither expressly nor inherently describes applying the protective material in a way that it contacts a base portion of a conductive structure.

Claim 7 depends from claim 6 and is further allowable since Tong does not expressly or inherently describe applying the protective material to form a support structure around the base portion of the conductive structure.

Claim 8, which also depends from claim 5, is further allowable as Tong lacks any express or inherent description of applying the protective material such that the protective material is spaced apart from a base portion of at least one conductive structure.

Claim 23 is further allowable since Tong contains no express or inherent description of healing the protective material while the polymer remains in a partially cured state.

Claim 24, which depends from claim 23, is further allowable because Tong does not expressly or inherently describe further curing the polymer following healing.

Claim 28 is further allowable because Tong includes no express or inherent description of healing the protective material by heating at least portions of the thermoplastic material located over peripheral regions of the adjacent semiconductor device components following severing and at least partially severing.

Withdrawal of the 35 U.S.C. § 102(e) rejections of each of claims 1-8 and 19-29 is respectfully solicited, as is allowance of these claims.

Rejections Under 35 U.S.C. § 103(a)

Claims 9-18 stand rejected under 35 U.S.C. § 103(a) for reciting subject matter which is assertedly unpatentable over that taught in Tong in view of teachings from U.S. Patent 6,650,019 to Glenn et al. (hereinafter “Glenn”).

The standard for establishing and maintaining a rejection under 35 U.S.C. § 103(a) is set forth in M.P.E.P. § 706.02(j), which provides:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant’s disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Claims 9-18 are each allowable, among other reasons, for depending directly or indirectly from claim 1, which is allowable.

It is also respectfully submitted that the teachings of Tong and Glenn do not support a *prima facie* case of obviousness against any of claims 9-18.

In this regard, it is respectfully submitted that one of ordinary skill in the art wouldn’t have had any reason to expect that teachings from Tong and Glenn could be combined in the

asserted manner. This is because the semiconductor devices disclosed in Tong, which include semiconductor dice with protective layers on the active surfaces thereof and solder balls protruding through the protective layers, could not be used in the stacked assemblies of Glenn, which require that laterally extending conductive elements, such as leads, extend from between adjacently stacked semiconductor devices.

Further, without the benefit of hindsight provided by the claims and disclosure of the above-referenced application, one of ordinary skill in the art wouldn't have been motivated to use the leads of Glenn in place of the solder balls of Tong, as doing so would have required substantial changes to the process disclosed in Tong; *e.g.*, leads would have to be electrically connected to the devices after dicing, as the leads of Glenn extend beyond the peripheries of the devices to which they correspond, while epoxy would have to be applied to the devices after the dicing and positioning of the leads, as the leads must be electrically isolated from both the device to which they correspond and from an adjacent, stacked device.

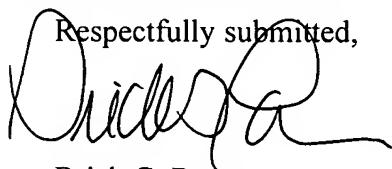
Therefore, is respectfully submitted that the asserted combination of teachings from Tong and Glenn does not support a *prima facie* case of obviousness against any of claims 9-18 of the above-referenced application.

Withdrawal of the 35 U.S.C. § 103(a) rejections of each of claims 9-18 is respectfully solicited, as is the allowance of these claims.

CONCLUSION

It is respectfully submitted that each of claims 1-29 is allowable. An early notice of the allowability of each of these claims is respectfully solicited, as is an indication that the above-referenced application has been passed for issuance. If any issues preventing allowance of the above-referenced application remain which might be resolved by way of a telephone conference, the Office is kindly invited to contact the undersigned attorney.

Respectfully submitted,



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BGP:TH/sfc:eg:csw

Enclosures: Replacement Sheets
Annotated Sheets Showing Changes

Document in ProLaw

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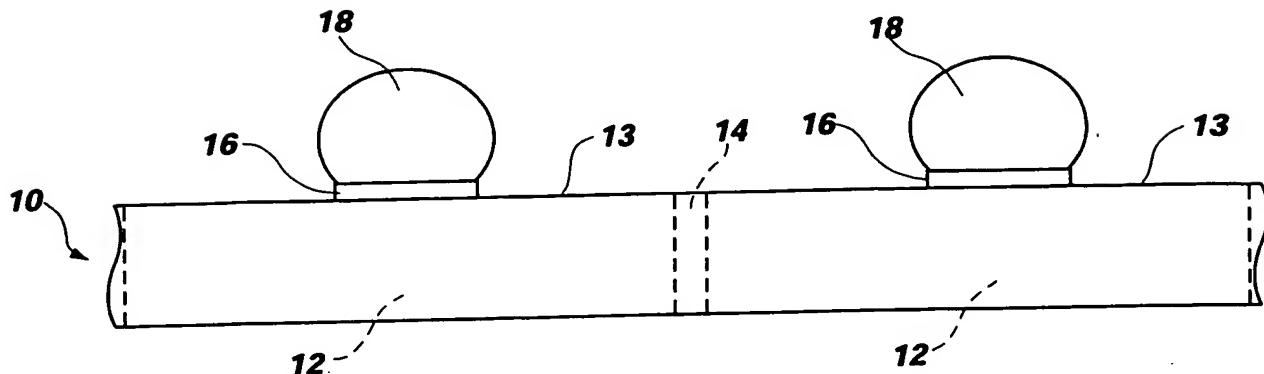


FIG. 1

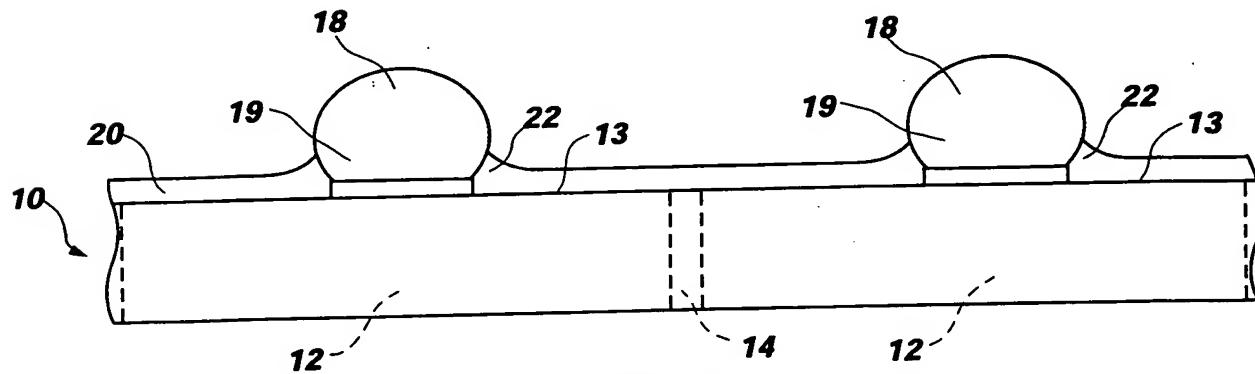


FIG. 2

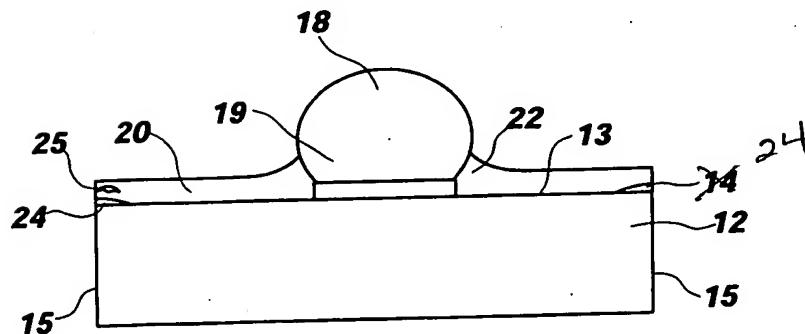


FIG. 3

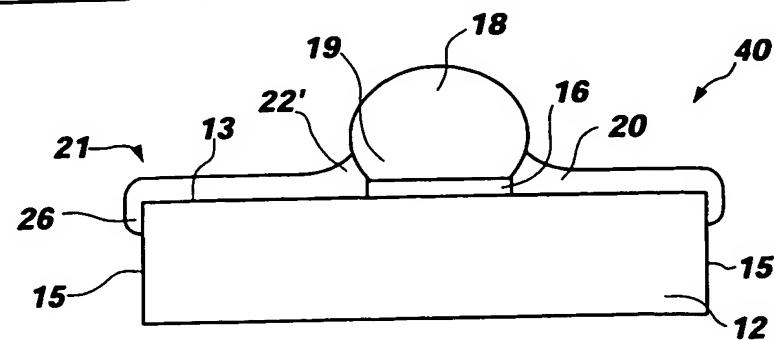


FIG. 4

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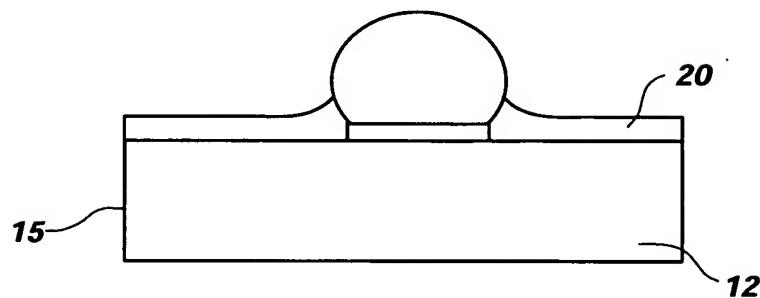


FIG. 4A

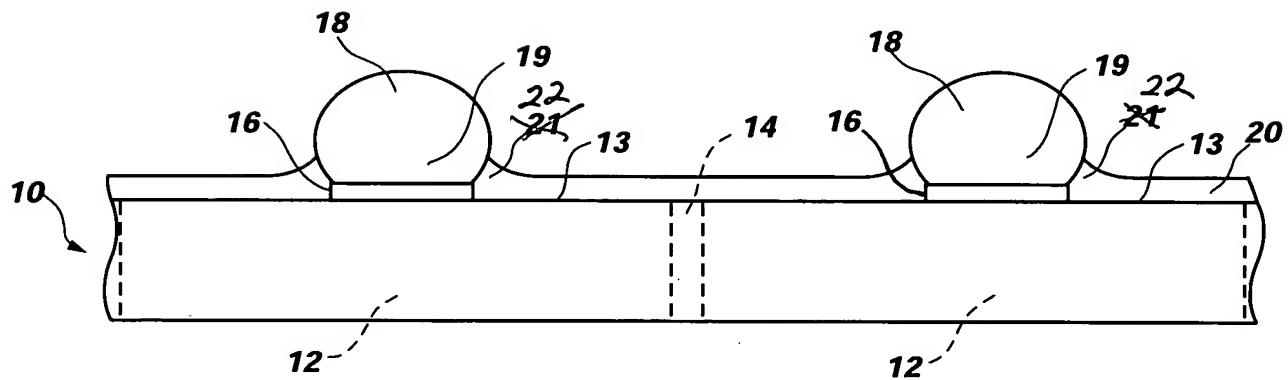


FIG. 5

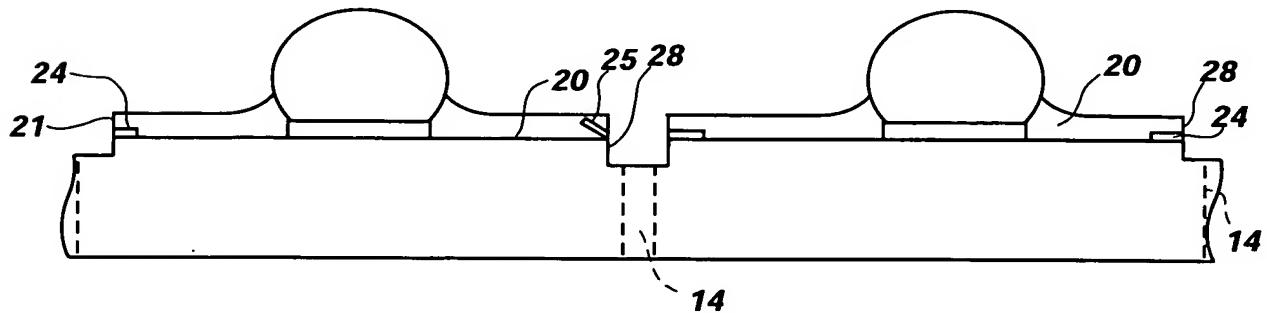


FIG. 6

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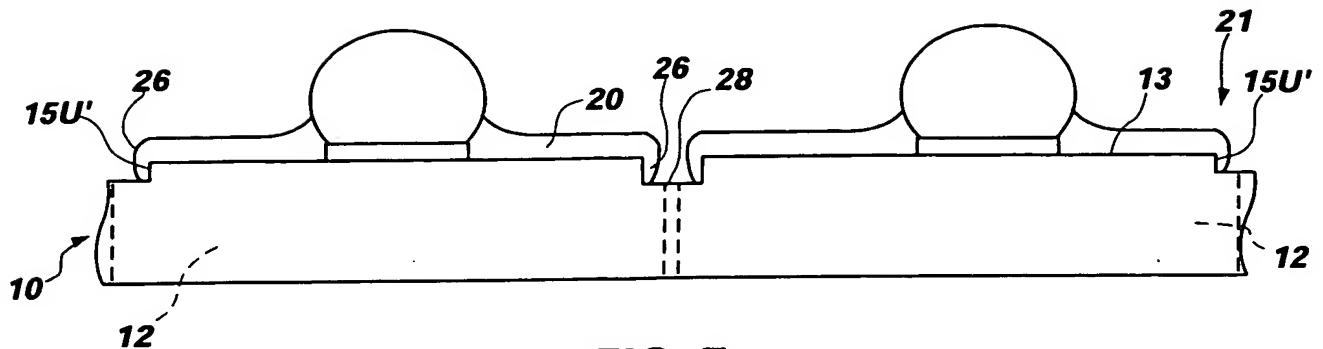


FIG. 7

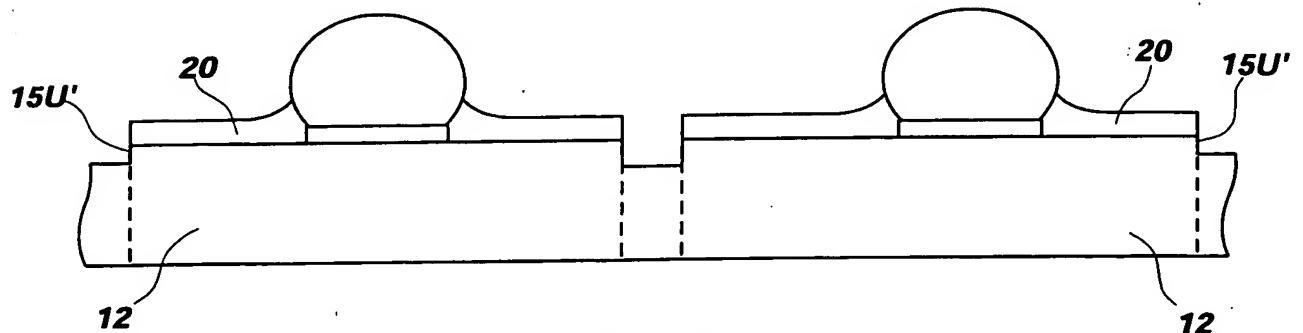


FIG. 7A

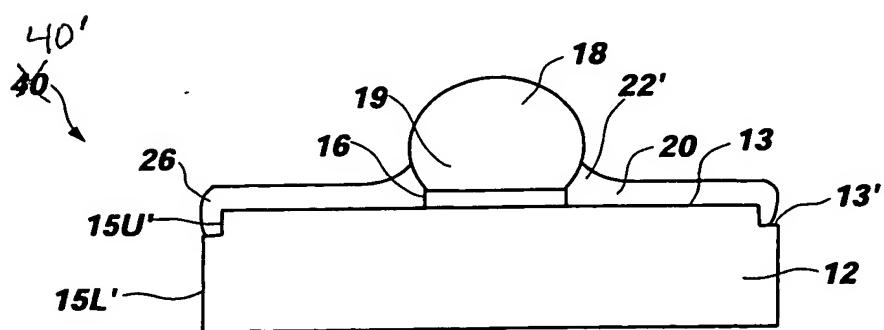


FIG. 8